

Figure 1

Tomato Leaf DHS cDNA sequence

19 ID 1 NT
19 ID 2 AA

CGCAGAACTCGCGGCGGCAGTCTTGTTCGGTACATAATCTTGGTCTGCAATAATGGGAGAAGCTCTGAAGTACAGTATCATGGAC
M G E A L K Y S I M D
TCAGTAAGATCGGTAGTTTTCAAAGAATCCGAAAATCTAGAAGGTTCTTGCACTAAAATCGAGGGCTACGACTTCAATAAAGGCGT
S V R S V V F K E S E N L E G S C T K I E G Y D F N K G V
TAACTATGCTGAGCTGATCAAGTCCATGGTTTCCACTGGTTTCCAAGCATCTAATCTTGGTGACGCCATTGCAATTGTTAATCAAA
N Y A E L I K S M V S T G F Q A S N L G D A I A I V N Q
TGCTAGATTGGAGGCTTTCACATGAGCTGCCACGGAGGATTGCAGTGAAGAAGAAAGAGATGTTGCATACAGAGAGTCCGTAACC
M L D W R L S H E L P T E D C S E E E R D V A Y R E S V T
TGCAAAATCTTCTGGGGTTCACTTCAAACCTTGTTCCTTCTGGTGTAGAGACACTGTCCGCTACCTTGTTCAGCACCGGATGGT
C K I F L G F T S N L V S S G V R D T V R Y L V Q H R M V
TGATGTTGTGGTTACTACAGCTGGTGGTATTGAAGAGGATCTCATAAAGTCCCTCGCACCAACCTACAAGGGGACTTCTCTTTAC
D V V V T T A G G I E E D L I K C L A P T Y K G D F S L
CTGGAGCTTCTCTACGATCGAAAGGATTGAACCGTATTGGTAACCTATTGGTTCTAATGACAACTACTGCAAAATTTGAGAATTGG
P G A S L R S K G L N R I G N L L V P N D N Y C K F E N W
ATCATCCCAGTTTGTGACCAAATGTATGAGGAGCAGATTAATGAGAAGGTTCTATGGACACCATCTAAAGTCATTGCTCGTCTGGG
I I P V F D Q M Y E E Q I N E K V L W T P S K V I A R L G
TAAAGAAATTAATGATGAAACCTCATACTTGTATTGGGCTTACAAGAACCGGATTCTGTCTTCTGTCTGGCTTGGAGGATGGAT
K E I N D E T S Y L Y W A Y K N R I P V F C P G L T D G
CACTTGGTGACATGCTATACTTCCATTCTTTCAAAAAGGGTGATCCAGATAATCCAGATCTTAATCCTGGTCTAGTCATAGACATT
S L G D M L Y F H S F K K G D P D N P D L N P G L V I D I
GTAGGAGATATTAGGGCCATGAATGGTGAAGCTGTCCATGCTGGTTTGAGGAAGACAGGAATGATTATACTGGGTGGAGGGCTGCC
V G D I R A M N G E A V H A G L R K T G M I I L G G G L P
TAAGCACCATGTTTGCAATGCCAATATGATGCGCAATGGTGCAGATTTTGCCGCTCTTCATTAACACCGCACAGAGTTTGATGGTA
K H H V C N A N M M R N G A D F A V F I N T A Q E F D G
GTGACTCTGGTGCCCGTCTGATGAAGCTGTATCATGGGGAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCA
S D S G A R P D E A V S W G K I R G G A K T V K V H C D A
ACCATGTCATTTCCCATATTAGTAGCTGAGACATTGTCAGCTAAGAGTAAGGAATTCTCCAGATAAGGTGCCAAGTTTGAACATT
T I A F P I L V A E T F A A K S K E F S Q I R C Q V
GAGGAAGCTGTCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACCTGCTAGTGTGCAGCACCATTATTTCTGCAAAA
CTGACTAGAGAGCAGGGTATATTCTCTACCCCGAGTTAGACGACATCCTGTATGGTTCAAATTAATTATTTTCTCCCTTCACA
CCATGTTATTTAGTTCTCTCTCTCGAAAGTGAAGAGCTTAGATGTTTCATAGGTTTGAATTATGTTGGAGGTTGGTGATAACT
GACTAGTCCTCTTACCATATAGATAATGTATCCTGTACTATGAGATTTTGGGTGTGTTTGATACCAAGGAAAATGTTTATTG
AAAACAATTGGATTTTAAATTTATTTTCTTGTTTAAAAA

005277" 67052650

Arabidopsis DeoxyHypusine Synthase (DHS) Predicted Sequence

Figure 2A

Met 5 = NT

GAAC TCCCAA ACCCTCTACTACTACACTTTTCAGATCCAAGGAAATCAATTTTGTCAATTCGAGCAACATGG
M
AGGATGATCGTGTTTCTCTTCGGTTCACCTCAACAGTTTTCAAAGAATCCGAATCATTGGAAGGAAAGTGT
E D D R V F S S V H S T V F K E S E S L E G K C
GATAAAATCGAAGGATACGATTTCATCAAGGAGTAGATTACCCAAAGCTTATGCGATCCATGCTCACCAC
D K I E G Y D F N Q G V D Y P K L M R S M L T T
CGGATTTCAAGCCTCGAATCTCGGCGAAGCTATTGATGTCGTCAATCAAATGGTTCGTTTCTCGAATTCAT
G F Q A S N L G E A I D V V N Q M
CAAAAATAAAATTCCTTCTTTTGTCTTTTGTCTTTTGGGTGAATTAGTAATGACAAAGAGTTTGAATT
F E F
TGTATTGAAGCTAGATTGGAGACTGGCTGATGAACTACAGTAGCTGAAGACTGTAGTGAAGAGGAGAAGA
V L K L D W R L A D E T T V A E D C S E E E K
ATCCATCGTTTAGAGAGTCTGTCAAGTGTAATCTTTCTAGGTTTCACTTCAAATCTTGTTCATCTGGT
N P S F R E S V K C K I F L G F T S N L V S S G
GTTAGAGATACTATTCTGTTATCTTGTTCAGCATCATATGGTTTGTGATTTTGTCTTTATCACCTGCTTTT
V R D T I R Y L V Q H H M
TTATAGATGTTAAAATTTTCGAGCTTTAGTTTTGATTTCAATGGTTTTTCTGCAGGTTGATGTTATAGTCA
V D V I V
CGACAACTGGTGGTGGTGGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTA
T T T G G V E E D L I K C L A P T F K G D F S L
CCTGGAGCTTATTTAAGGTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATACTACTG
P G A Y L R S K G L N R I G N L L V P N D N Y C
CAAGTTTGAGGATTGGATCATTCCCATCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGGTATTGCTTT
K F E D W I I P I F D E M L K E Q K E E
ATCTTTCTCTTTTATATGATTTGAGATGATTCTGTTTGTGCGTCACTAGTGGAGATAGATTTGATTCCTC
TCTTGCATCATTGACTTCGTTGGTGAATCCTTCTTCTCTGTTTTCCTTGTAGAATGTGTGTGGACTC
N V L W T
CTTCTAAACTGTTAGCACGGCTGGGAAAAGAAATCAACAATGAGAGTTCATACCTTTATTTGGGCATACAG
P S K L L A R L G K E I N N E S S Y L Y W A Y K
GTATCCAAAATTTTAACCTTTTGTAGTTTTTAAATCATCCTGTGAGGAACCTCGGGGATTTAAATTTTCCGCT
TCTTGTGGTGTGTGTAGATGAATATTCCAGTATTCTGCCAGGGTTAACAGATGGCTCTCTTGGGGATATG
M N I P V F C P G L T D G S L G D M
CTGTATTTTCACTCTTTTCTGACCTCTGGCCTCATCATCGATGTAGTACAAGGTACTTCTTTTACTCAATA
L Y F H S F R T S G L I I D V V Q
AGTCAGTGTGATAAATATTCTGCTACATCTAGTGCAGGAATATTGTAAGTAGTAGTGCAATTGTAGCTTTT
CCAATTCAGCAACGGACTTTACTGTAAGTTGATATCTAAAGGTTCAAACGGGAGCTAGGAGAATAGCATAG
GGGCATTCTGATTTAGGTTTGGGGCACTGGGTTAAGAGTTAGAGAATAATAATCTTGTAGTTGTTTATCA
AACTCTTTGATGGTTAGTCTCTTGGTAATTTGAATTTTATCACAGTGTATGTTGTTGAACCAAGTTAAT
GTTTTATGAACAGATATCAGAGCTATGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGAT
D I R A M N G E A V H A N P K K T G M I
AATCCTTGGAGGGGCTTGCCAAAGCACCACATATGTAATGCCAATATGATGCGCAATGGTGCAGATTACG
I L G G G L P K H H I C N A N M M R N G A D Y
CTGTATTTATAAACACCGGGCAAGAATTTGATGGGAGCGACTCGGGTGCACGCCCTGATGAAGCCGTGTCT
A V F I N T G Q E F D G S D S G A R P D E A V S
TGGGGTAAATAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTTAAATTTCTTCACATCCTAATTTATA
W G K I R G S A K T V K V C F L I S S H P N L Y
TCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTTGCAGGTATACTGTGATGCTACCATA
L T Q W F
GCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACCAAACCTGTGAGTCTAAGACTTAAGA
ACTGACTGGTCTGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTTTGATTTTACACTGGAGTGACCATAT
AACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGAATTGTACTTTAGTTTCTCTCAACCT
AAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTGTAGTCAATAATCCTTTGCCTTATAA
AATTATTCAAGTTCCAACAACACATTGTGATTCTGTGACAAGTCTCCCGTTGCCTATGTTCACTTCTCTGCG

09725019-12900

Figure 2B

MEDDRVFSVHSTVFKESSELEGKCDKIEGYDFNQGVDPKLMRSLTTGFGASNLGEAIDVVNQMFVFLKLDWRLADETTV
AEDCSEEEKNPSFRESVKCKIFLGFTSNLVSSGVRDTIRYLVOHHMVDVIVTTTGGVEEDLIKCLAPTFKGDFSLPGAYLRSK
GLNRIGNLLVPNDNYCKFEDWIIPIFDEMLKEQKEENVLWTPSKLLARLGKEINNESSYLYWAYKMNI PVFCPGLTDGSLGDM
LYFHSFRTSGLIIDVVQDIRAMNGEAVHANPKKTGMIILGGGLPKHHICNANMMRNGADYAVFINTGQEFDGSDSGARPDEAV
SWGKIRGSAKTVKVCFLISSHPNLYLTQWF

Figure 2C

GGTGGTGTTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTACCTGGAGCTTATTTAAG
GTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATAACTACTGCAAGTTTGAGGATTGGATCATTCCCA
TC'TTTGACGAGATGTTGAAGGAACAGAAAGAAGAGAATGTGT'TGTGGACTCCTTCTAAACTGTTAGCACGGCTGGGAAAA
GAAATCAACAATGAGAGTTCATACCTTTATTGGGCATACAAGATGAATATTCCAGTATTCTGCCCAGGGTTAACAGATGG
CTCTCTTAGGGATATGCTGTATTTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATATCAGAGCTA
TGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAGCACACATA
TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAAACACCGGGCAAGAATTTGATGGGAGCGACTC
GGGTGCACGCCCTGATGAAGC

Figure 2D

GGVEEDLIKCLAPTFKGDFSLPGAYLRSKGLNRIGNLLVPNDNYCKFEDWIIPIFDEMLKEQKEENVLWTPSKLLARLGKEIN
NESSYLYWAYKMNI PVFCPGLTDGSLRDMLYFHSFRTSGLIIDVVQDIRAMNGEAVHANPKKTGMIILGGGLPKHHICNANMM
RNGADYAVFINTGQEFDGSDSGARPDE

005217-6T052260

Multiple DHS Sequence Alignments of Human, Arabidopsis, Tomato, Yeast, Neurospora(Fungi), and Methanococcus(Archaeobacteria)

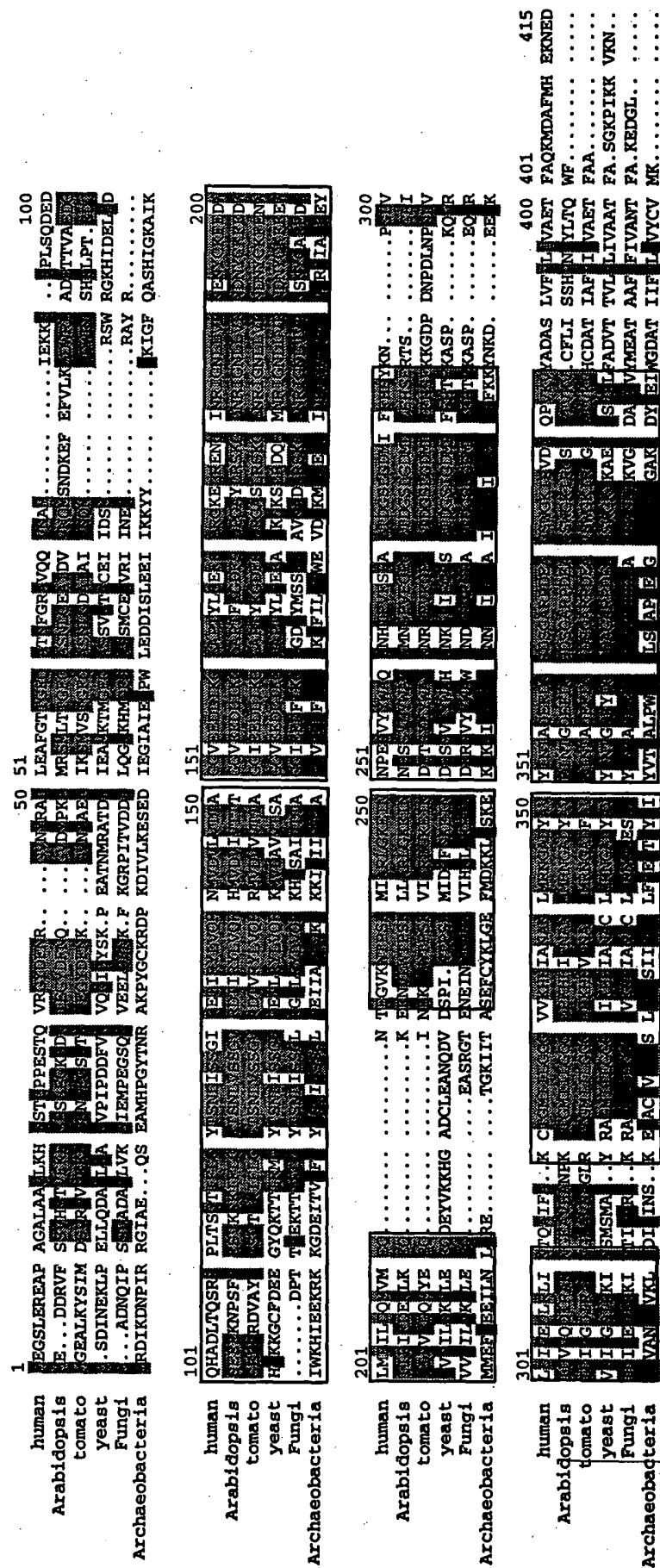
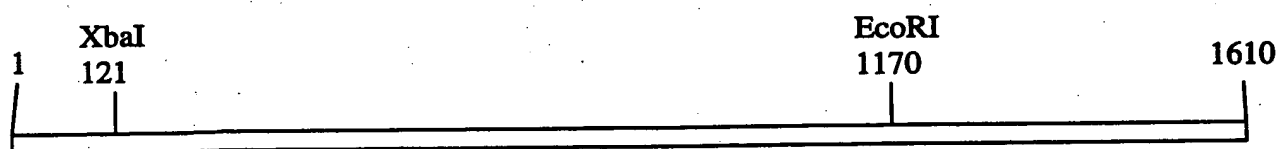


Figure 4



005277-6T052260

Figure 5

Southern Analysis of DHS

EcoRI EcoRV HindIII XbaI

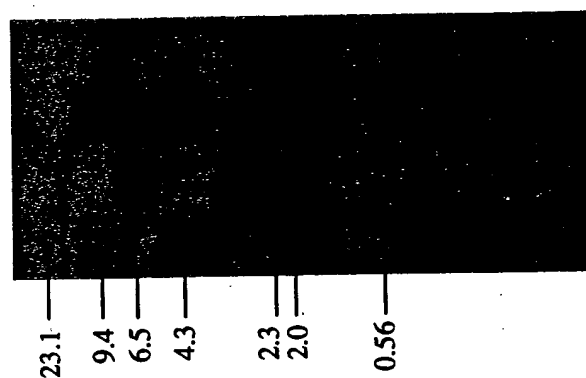
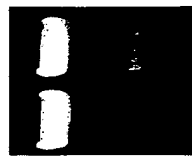


Figure 6

Northern Analysis of DHS on Tomato Flowers

**Blossom
and
Bud
Senescence**



RNA



Northern

Northern Analysis of DHS on Developmental Stages of

Tomato Fruit

Ripe
Breaker Pink (red)

Northern
Blot



Figure 8

Northern Analysis of DHS - 2M Sorbitol treated Tomato Leaves

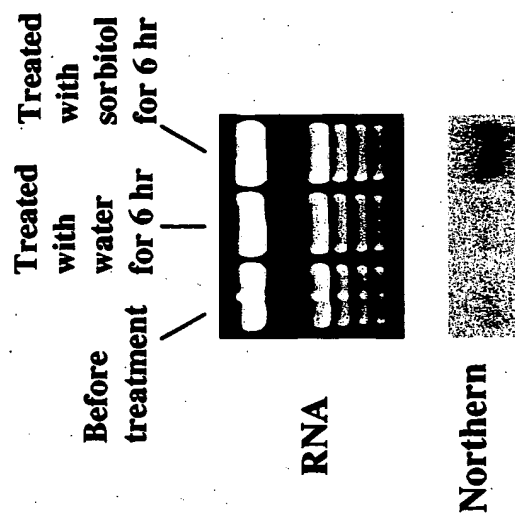
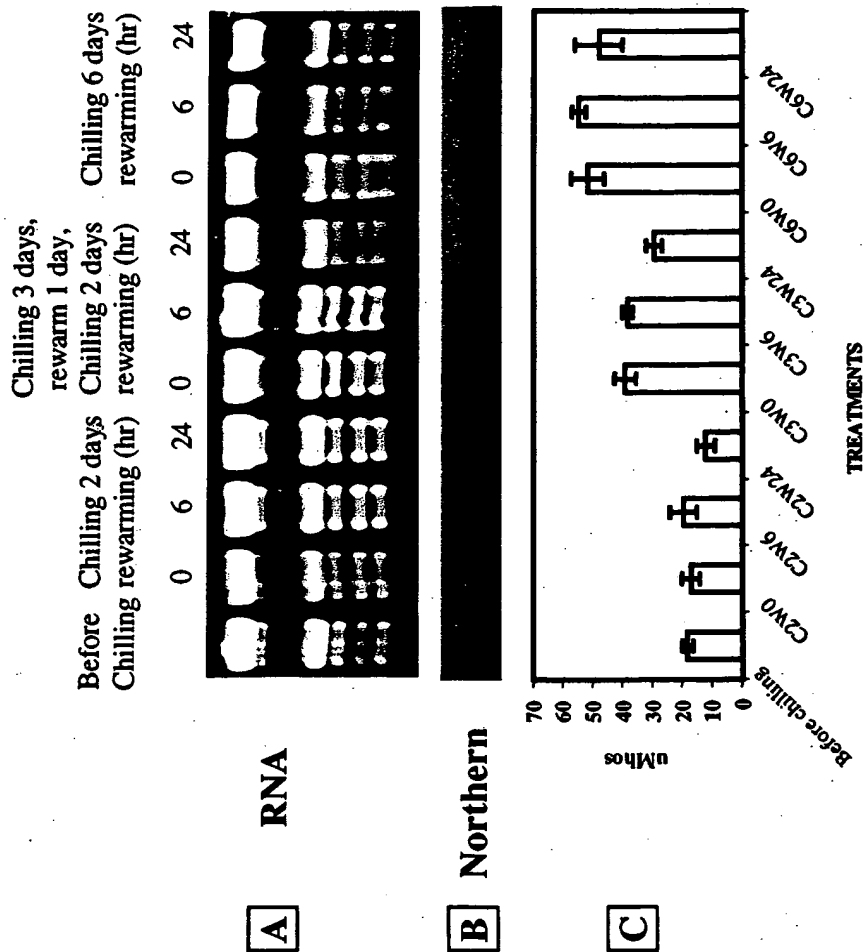


Figure 9

Northern Analysis of DHS Tomato Leaf Chilling Effects



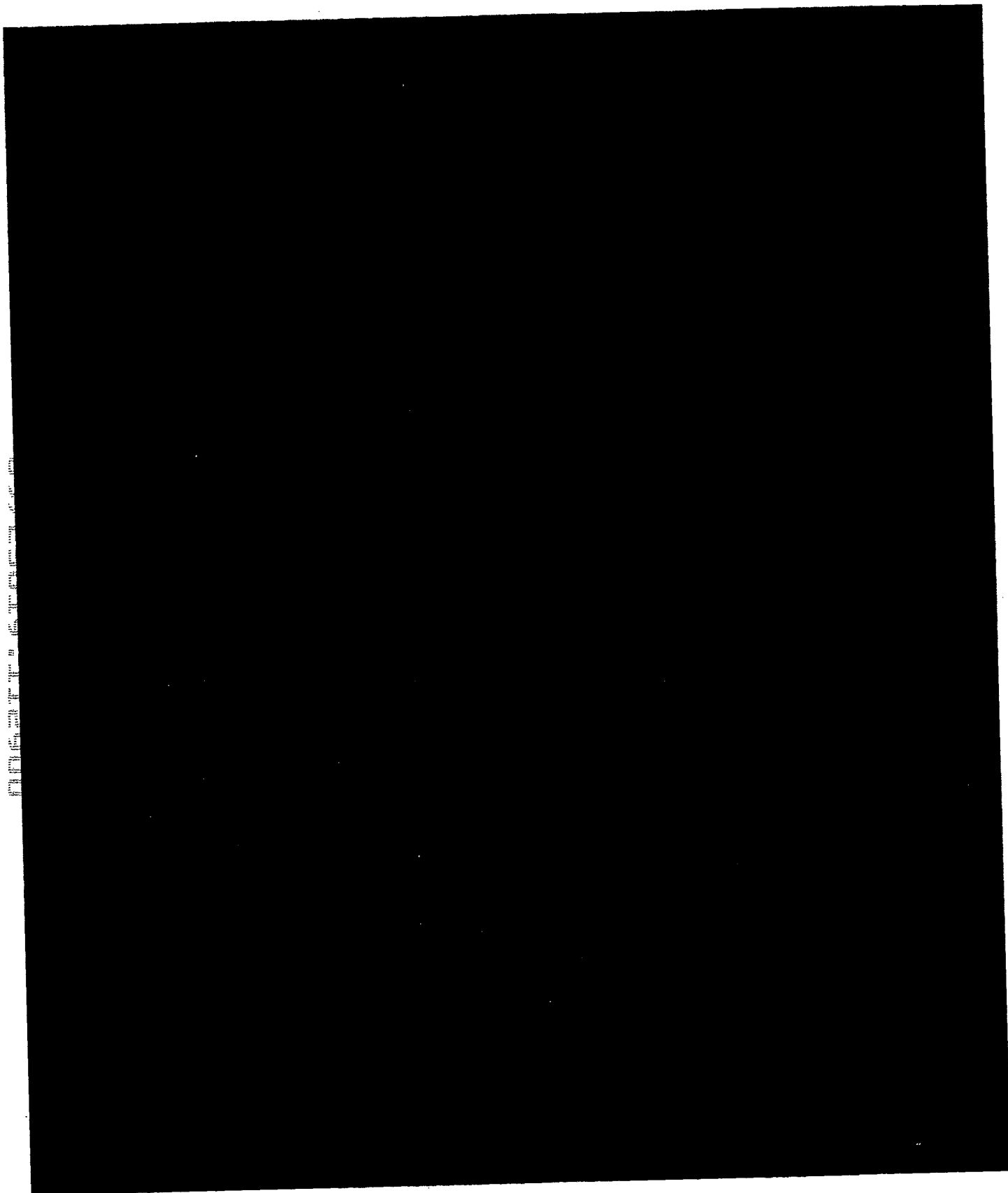


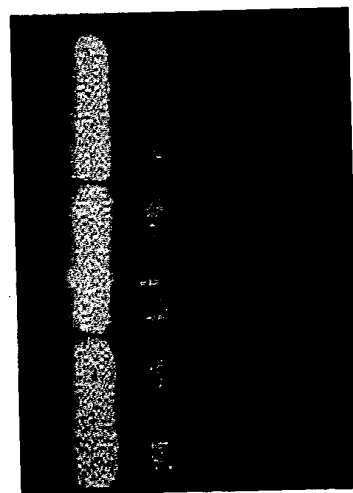
Figure 10

Northern Analysis of WT AT Aging Leaves

Week 5 6 7



Northern Blot

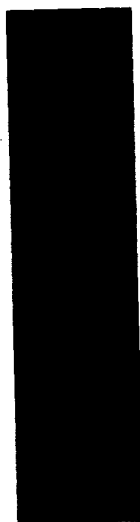


RNA Gel

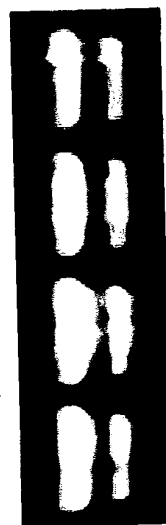
Figure 11

Northern Analysis of Canation Petal (*In Situ*)DHS

Stage I II III IV



Northern Blot



RNA Gel

Figure 12

Tomato if5A Figure 13

AAAGAATCCTAGAGAGAGAAAGGAATCCTAGAGAGAGAAAGCATGTCGGACGAAAGAACAC
M S D E E H
CATTTTGAGTCAAAGGCAGATGCTGGTGCCTCAAAAACTTTCCACAGCAAGCTGGAACC
H F E S K A D A G A S K T F P Q Q A G T
ATCCGTAAGAATGGTTACATCGTTATCAAAAGCCGTCCTGCAAGGTTGTTGAGGTCCTCC
I R K N G Y I V I K G R P C K V V E V S
ACTTCAAAAACCTGAAAAACACGGACATGCTAAATGTCACCTTTGTGGCAATTGACATTTTC
T S K T G K H G H A K C H F V A I D I F
AATGGAAGAAACTGGAAGATATCGTTCCGTCCTCCACAATTGTGATGTGCCACAATGTT
N G K K L E D I V P S S H N C D V P H V
AACCGTACCGACTATCAGCTGATTGATATCTCTGAAGATGGTTTGTCTCACTTCTTACT
N R T D Y Q L I D I S E D G F V S L L T
GAAAGTGAAACACCAAGGATGACCTCAGGCTTCCCAACCGATGAAAAATCTGCTGAAGCAG
E S G N T K D D L R L P T D E N L L K Q
GTTAAAGATGGGTTCCAGGAAGGAAAGGATCTTGTGGTGTCTGTATGTCTGCGATGGGC
V K D G F Q E G K D L V V S V M S A M G
GAAGAGCAGATTAAACGCCGTTAAGGATGTTGGTACCACCAAGAATTAGTTATGTCATGGCAGC
E E Q I N A V K D V G T K N
ATAATCACTGCCAAAGCTTTAAGACATTATCATATCCTAATGTGGTACTTTGATATCACT
AGATTATAAACTGTGTTATTTGCACTGTTCAAAACAAAGAAAGAAACTGCTGTTATGG
CTAGAGAAAAGTATTGGCTTTGAGCTTTTGACAGCACAGTTGAACATATGTGAAAATTCTAC
TTTTTTTTTTTTGGGTAAAAATACTGCTCGTTTAAATGTTTGCAAAAAAATAAAAAAAA

764 bps, not including Poly(A) tail; 160 amino acids

Figure 13

790 bps, 160 amino acids

Figure 14

Arabi dopsi s F5A

CTGTTACCAAAAAATCTGTACCGCAAAATCCTCGTGAAGCTCGCTGCTCAACCATGTC
M S
CGACGAGGAGCATCACTTTGAGTCCAGTGACGCCGGAGCGTCCAAAAACCTACCCCTCAACA
D E E H H F E S S D A G A S K T Y P Q Q
AGCTGGAACCATCCGTAAGAATGGTTACATCGTCATCAAAAATCGTCCCTGCAAGGTTGT
A G T I R K N G Y I V I K N R P C K V V
TGAGGTTTCAACCTCGAAGACTGGCAAGCATGGTCATGCTAAATGTCAATTTGTAGCTAT
E V S T S K T G K H G H A K C H F V A I
TGATATCTTACCAGCAAGAACTCGAAGATATTGTTCTTCTTCCCACAATTGTGATGT
D I F T S K K L E D I V P S S H N C D V
TCCTCATGTCAACCGTACTGATTATATCAGCTGATGACATTTCTGAAGATGGATATGTCAG
P H V N R T D Y Q L I D I S E D G Y V S
TTTGTGACTGATAACGGTAGTACCAAGGATGACCTTAAGCTCCCTAATGATGACACTCT
L L T D N G S T K D D L K L P N D D T L
GCTCCAACAGATCAAGAGTGGGTTTGATGATGGAAGATCTAGTGGTGAGTGAATGTC
L Q Q I K S G F D D G K D L V V S V M S
AGCTATGGGAGAGGAACAGATCAATGCTCTTAAGGACATCGGTCCCCAAGTGAGACTAACA
A M G E E Q I N A L K D I G P K
AAGCCTCCCCCTTTGTATGAGATTTCTTCTTCTGTAGGCTTCCATTACTCGTCGGAGA
TTATCTTGTGTTTGGGTTACTCCTATTTTGGATATTTAAACTTTTGTAAATAATGCCATC
TTCTTCAACCTTTTCCCTCTAGATGGTTTTATATCTTCTTCT

754 bps, not including Poly(A) tail; 158 amino acids

Figure 15

Northern Analysis of WT AT DHS and F5A

Aging Leaves

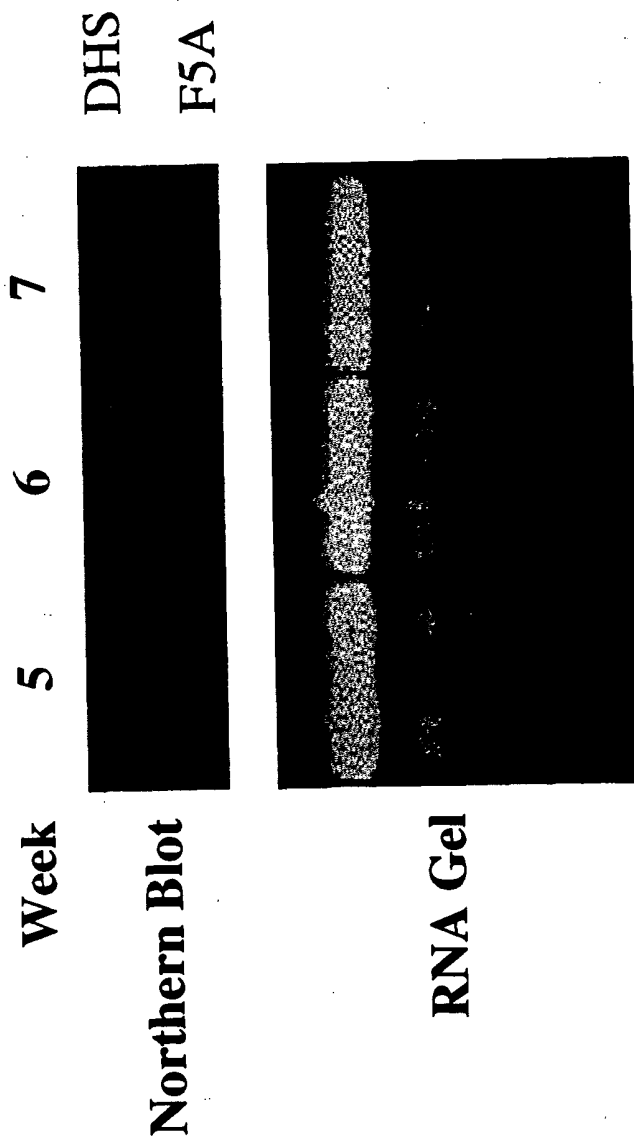


Figure 16

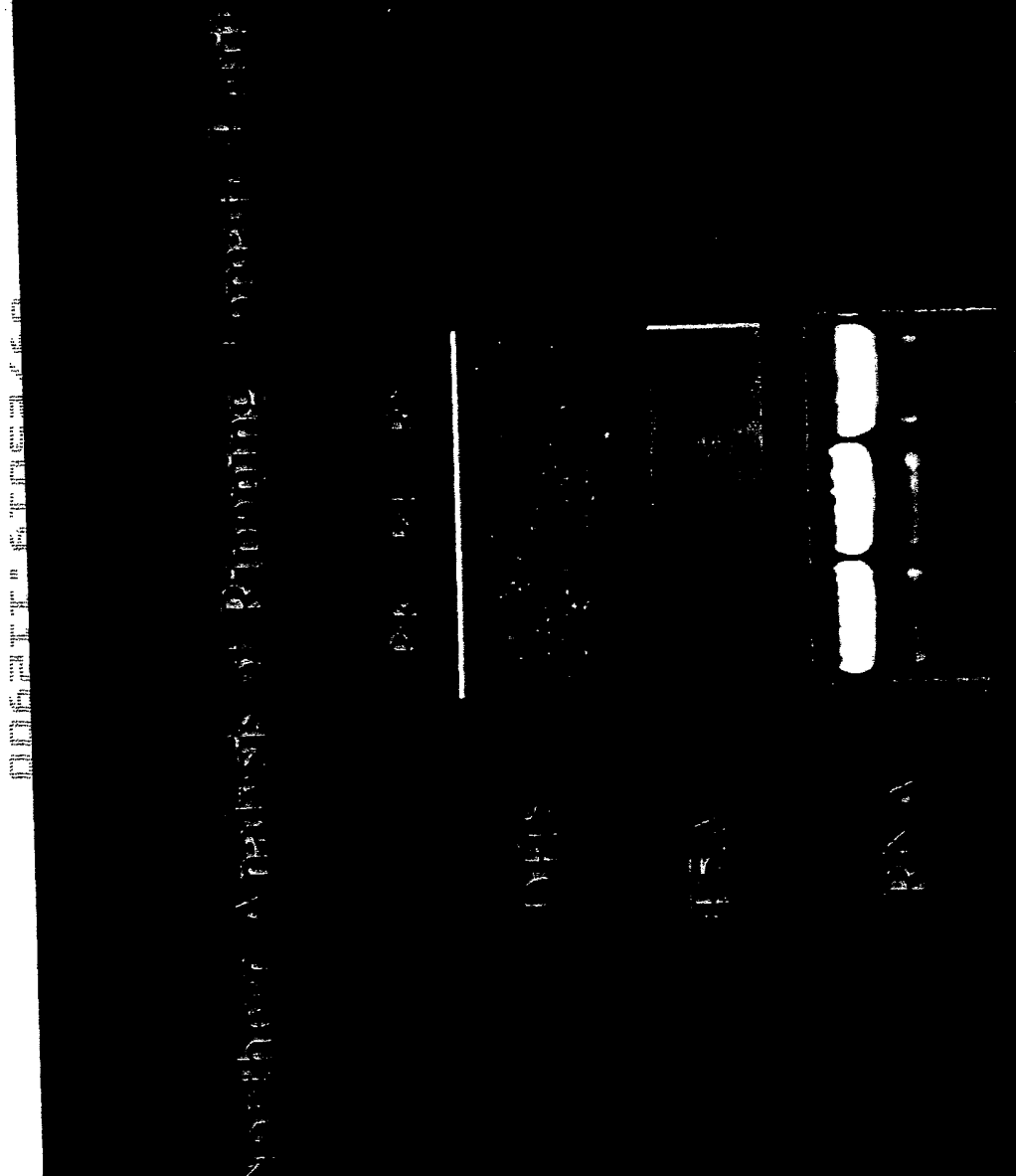


Figure 17



Figure 18

CONFIDENTIAL

Nonlinear Analysis of the Thermal Expansion of

Thermal Expansion of
Thermal Expansion of
Thermal Expansion of

Sheet

Fig. 1

Fig. 2

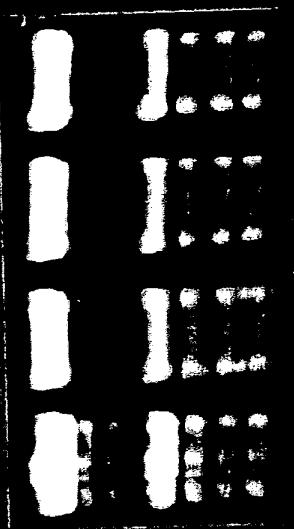


Figure 20

3.1 Weeks

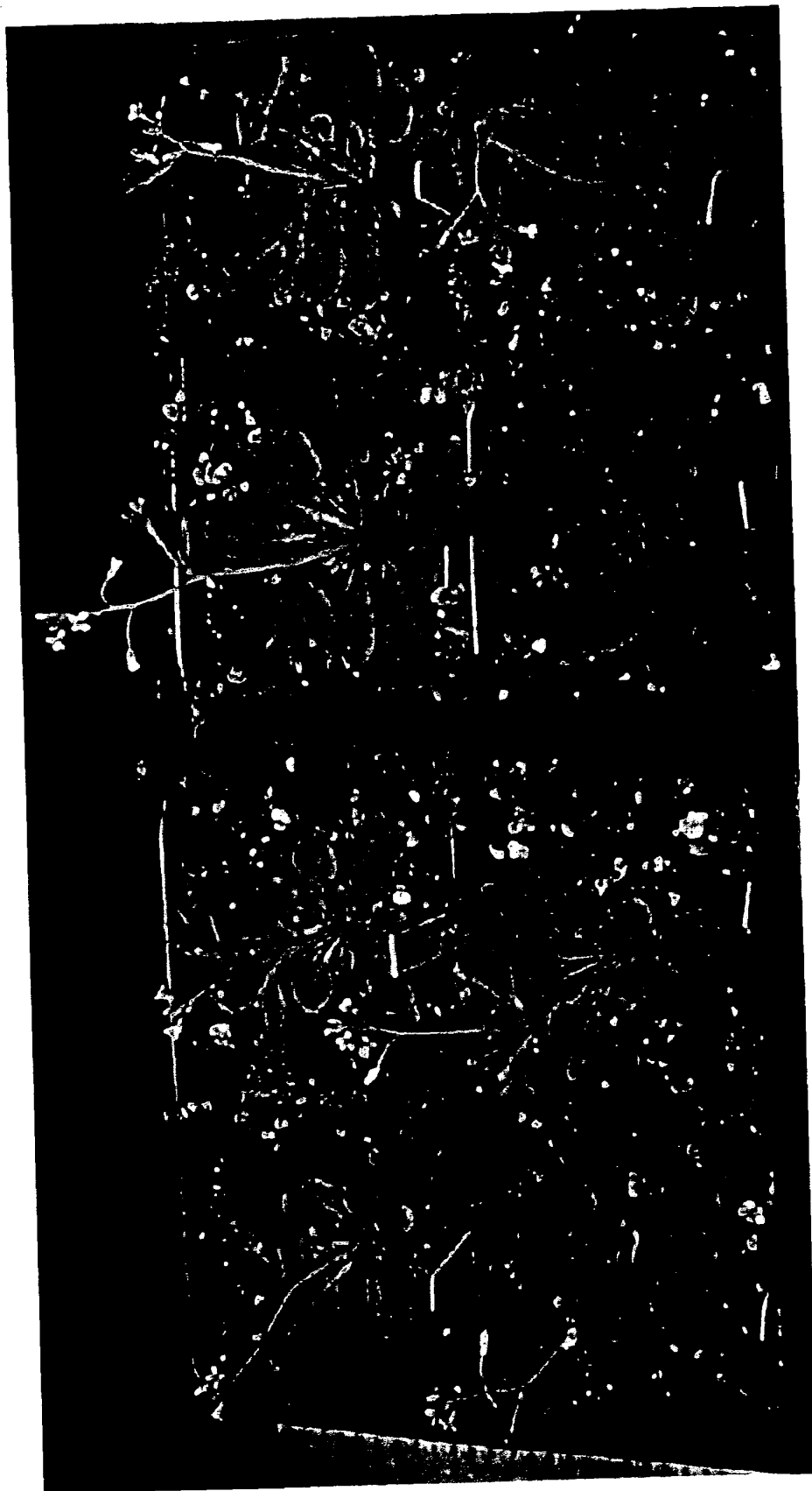


Wild-Type

α - 3'DHS #3

Figure 21

4.6 Weeks



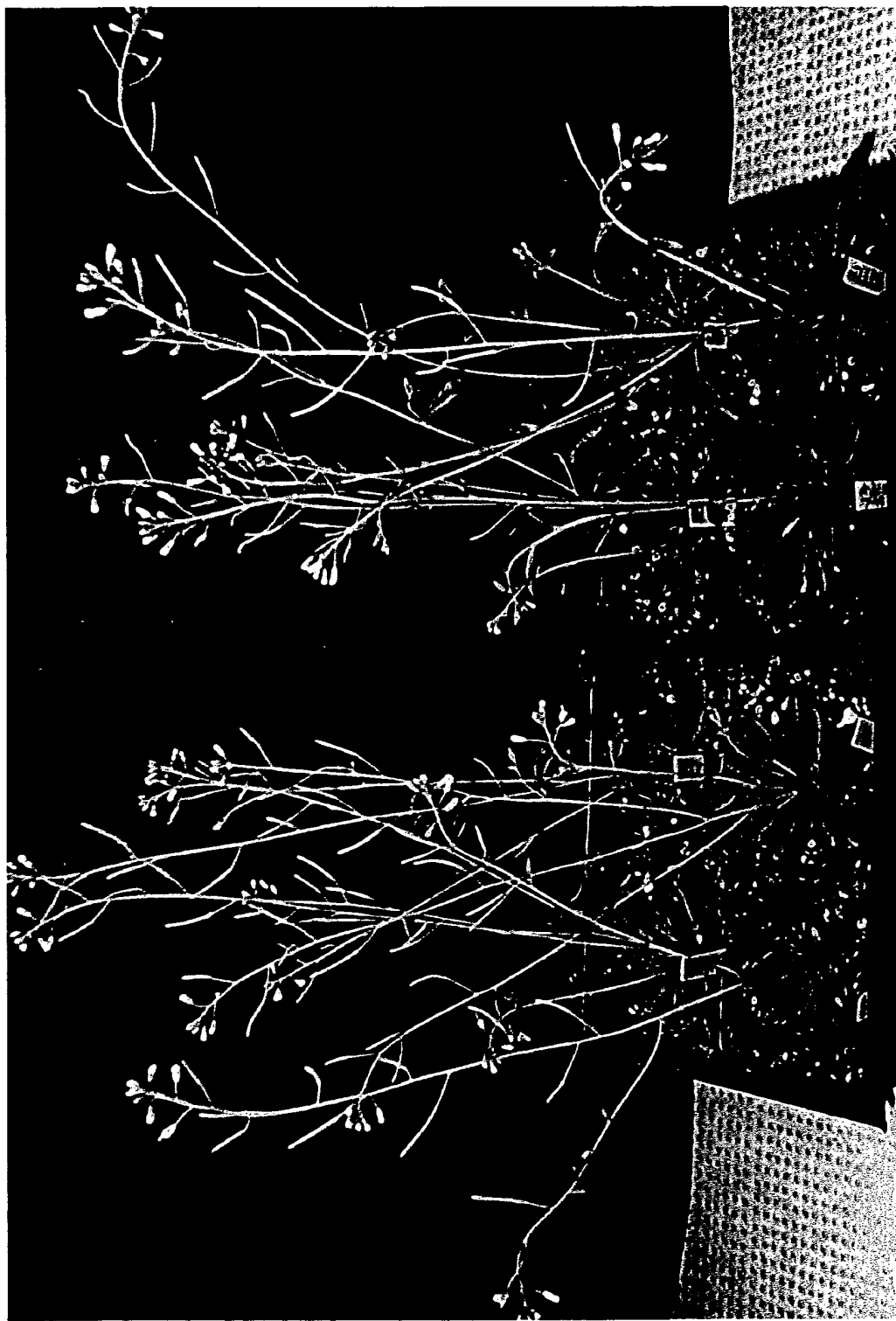
α - 3'DHS #3

Wild-Type

Figure 22

00627T 6T052260

5.6 Weeks



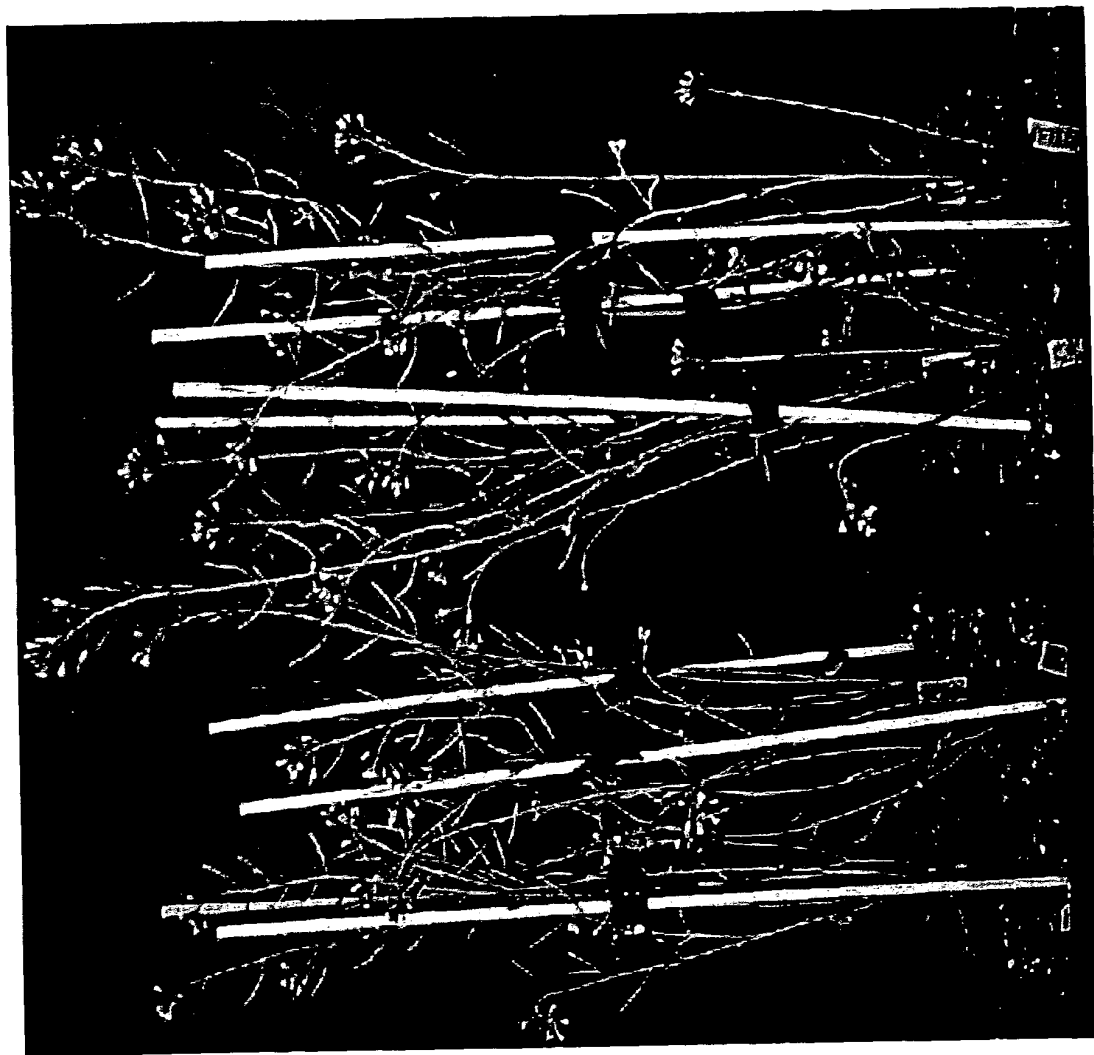
Wild-Type

α - 3'DHS # 7

Figure 23

006277 5 TDS2260

6.1 Weeks



α - 3'DHS #7

Wild-Type

Figure 24

Seed Volume of Transgenic antisense-3'DHS plants

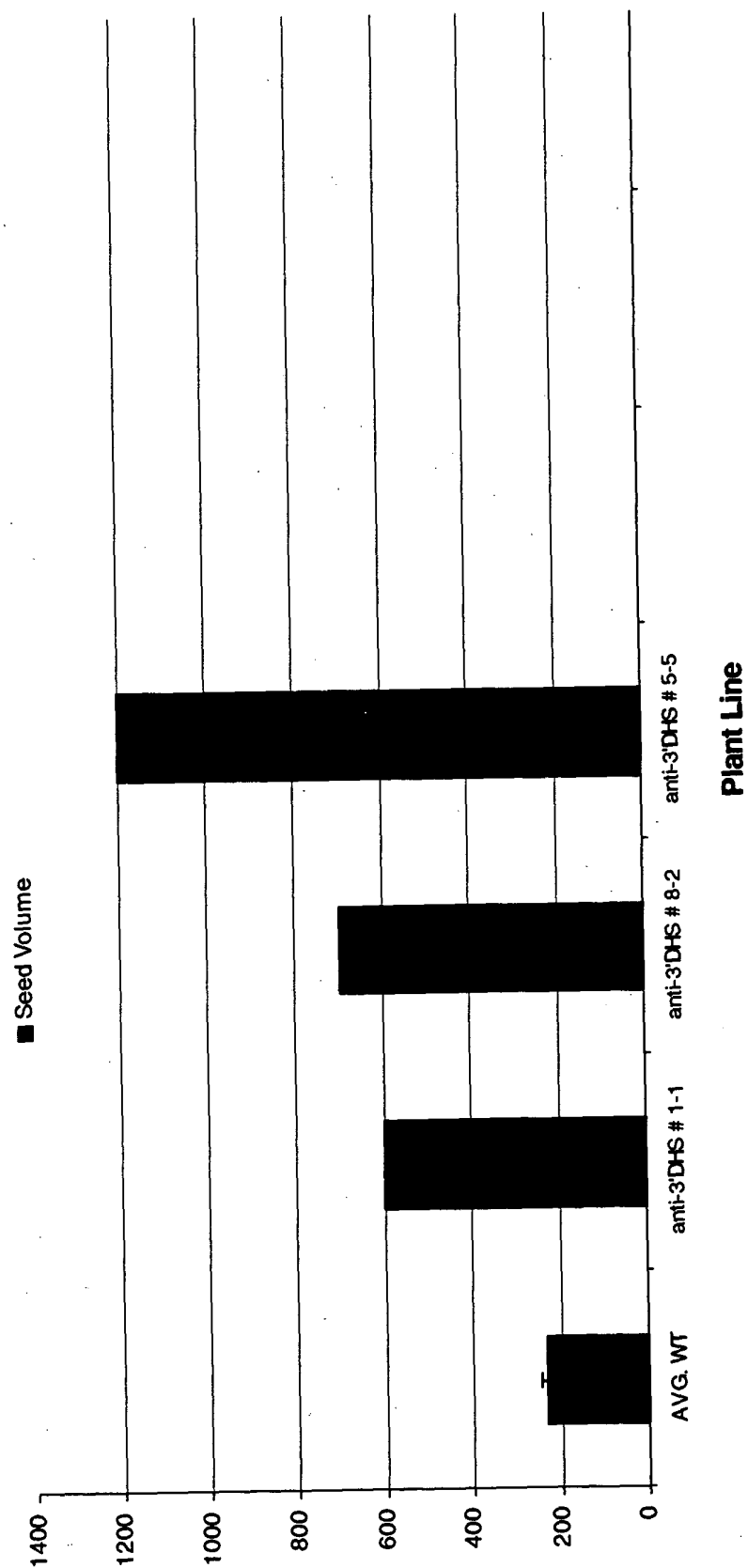


Figure 25

006211-61092260

18 Days

Wild type

Anti 3'-DHS

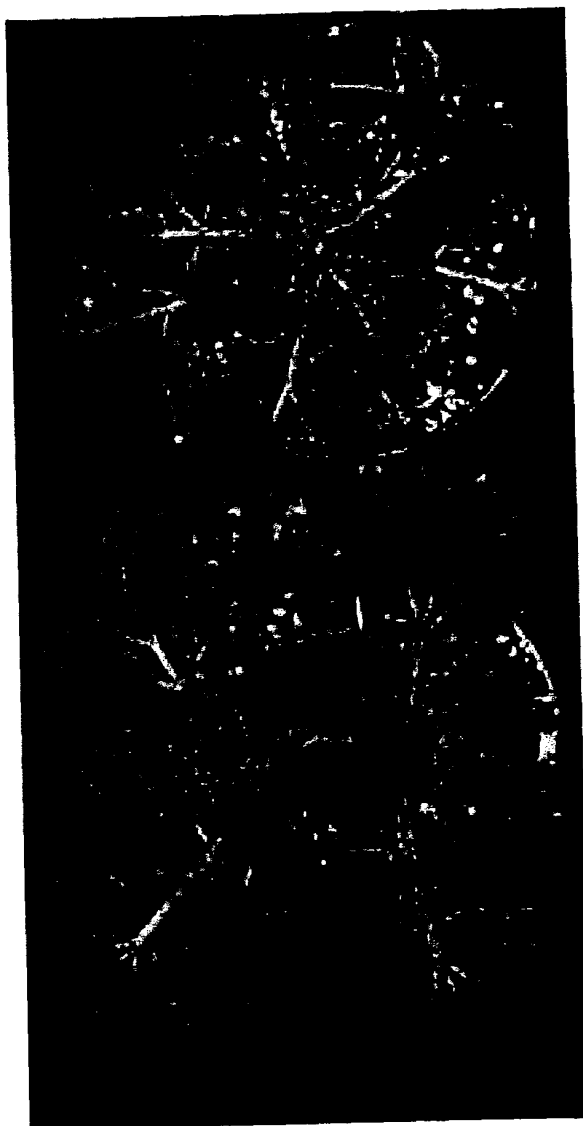


Figure 26

005211-6T052460

32 Days

Anti 3'-DHS

Wild type



Figure 27

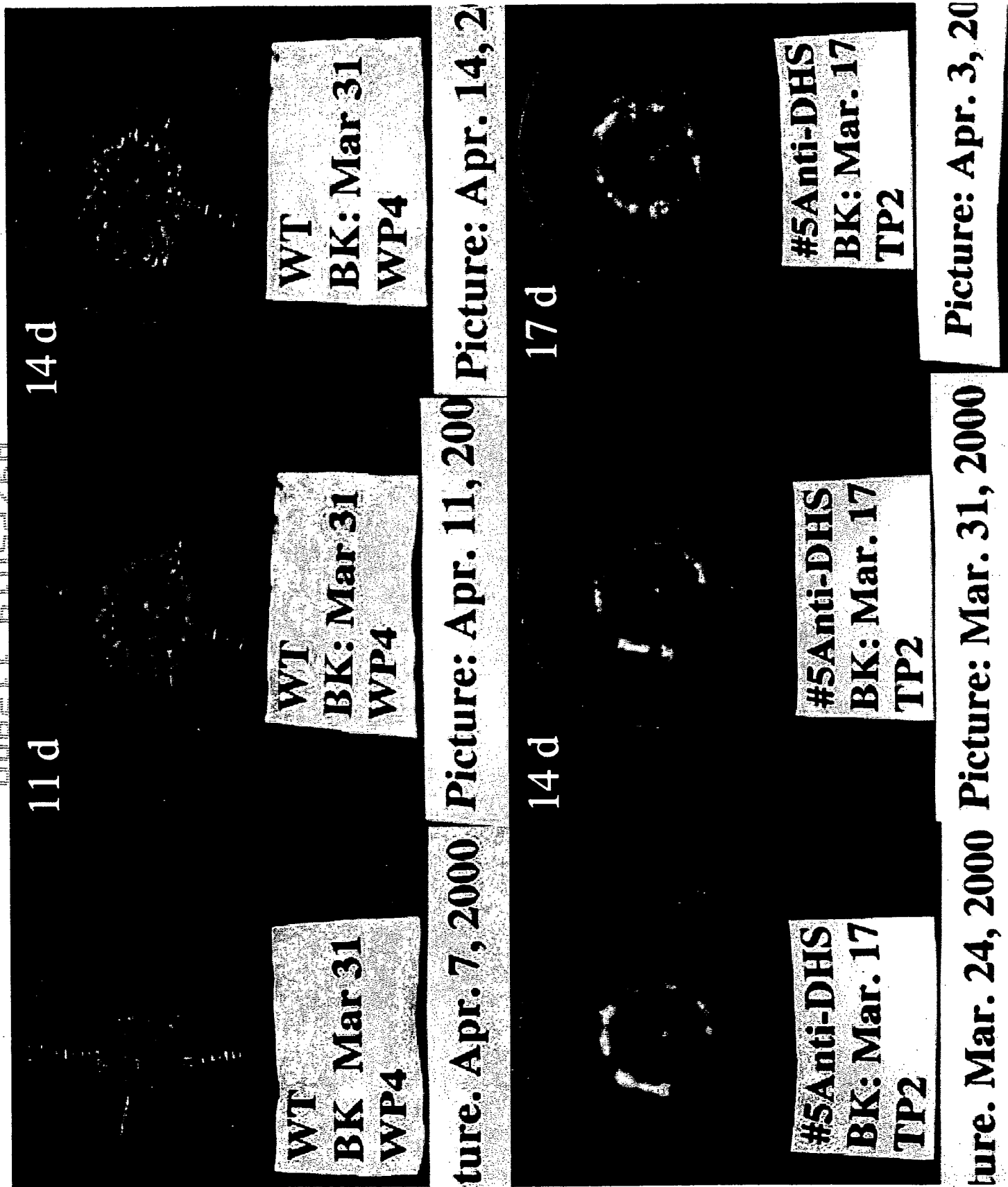
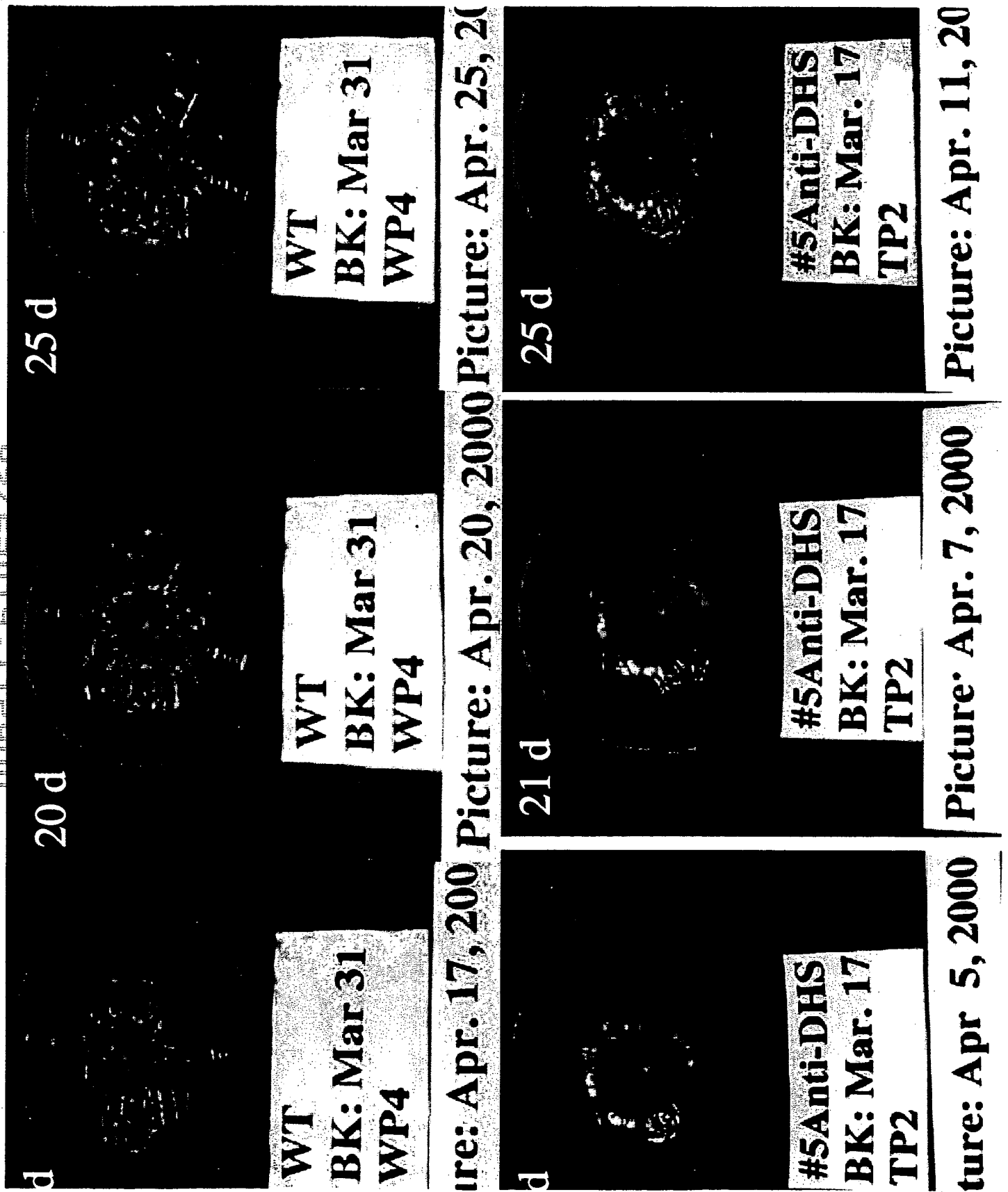


Figure 29

Figure 30



31d

IV

BK: Mar 31

WP4

W

BK: Mar 31

WP4

Picture: Apr. 28, 200

Picture: May 1, 2000

5

31 d

#5Anti-DHS

BK: Mar. 17



#5 Anti-DHS

BK: Mar. 17

TP2

#5 Anti-DHS

BK: Mar 17

2

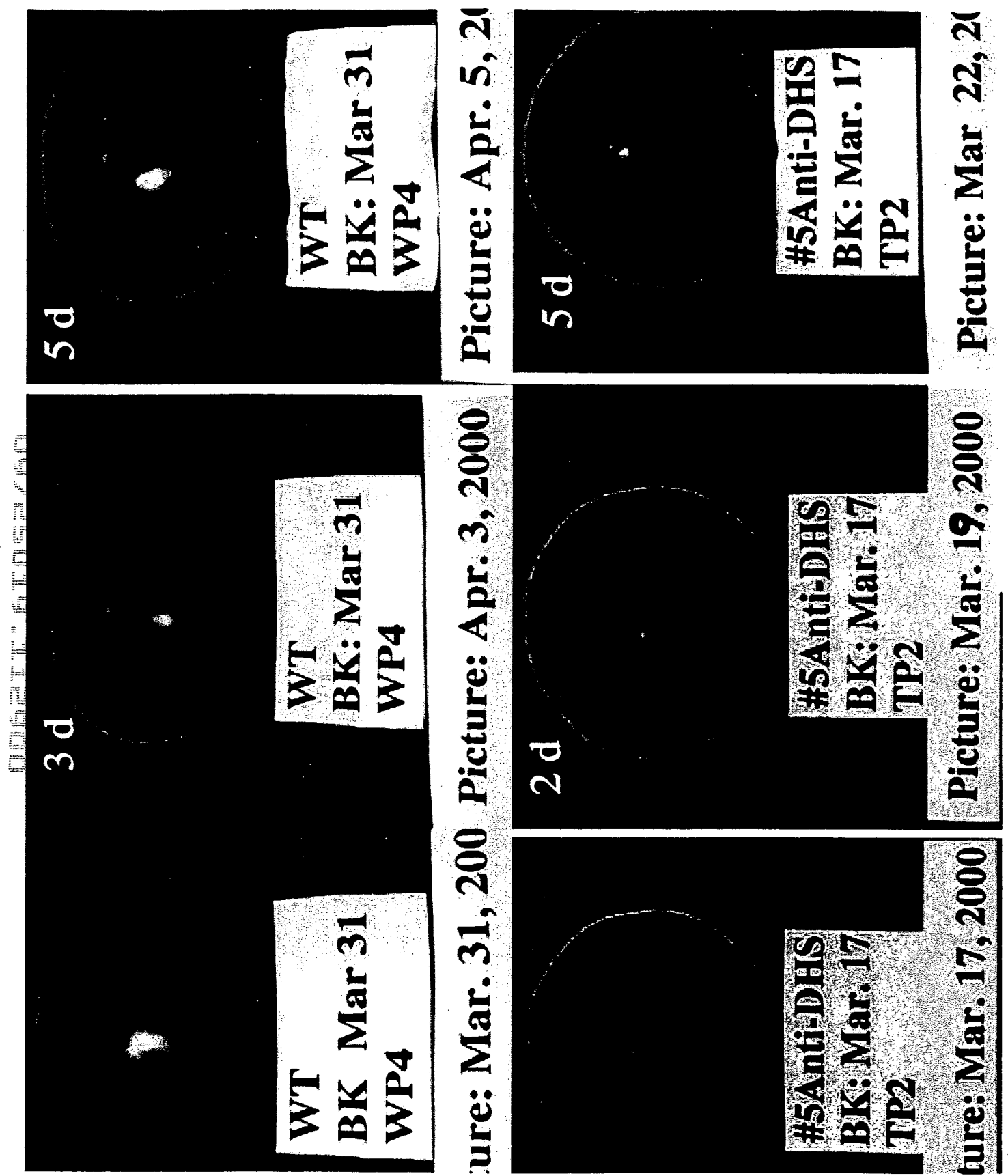
ture: Apr. 14, 2000

Picture: Apr. 17, 2000

Picture: Apr. 20, 20

Figure 31

Figure 32



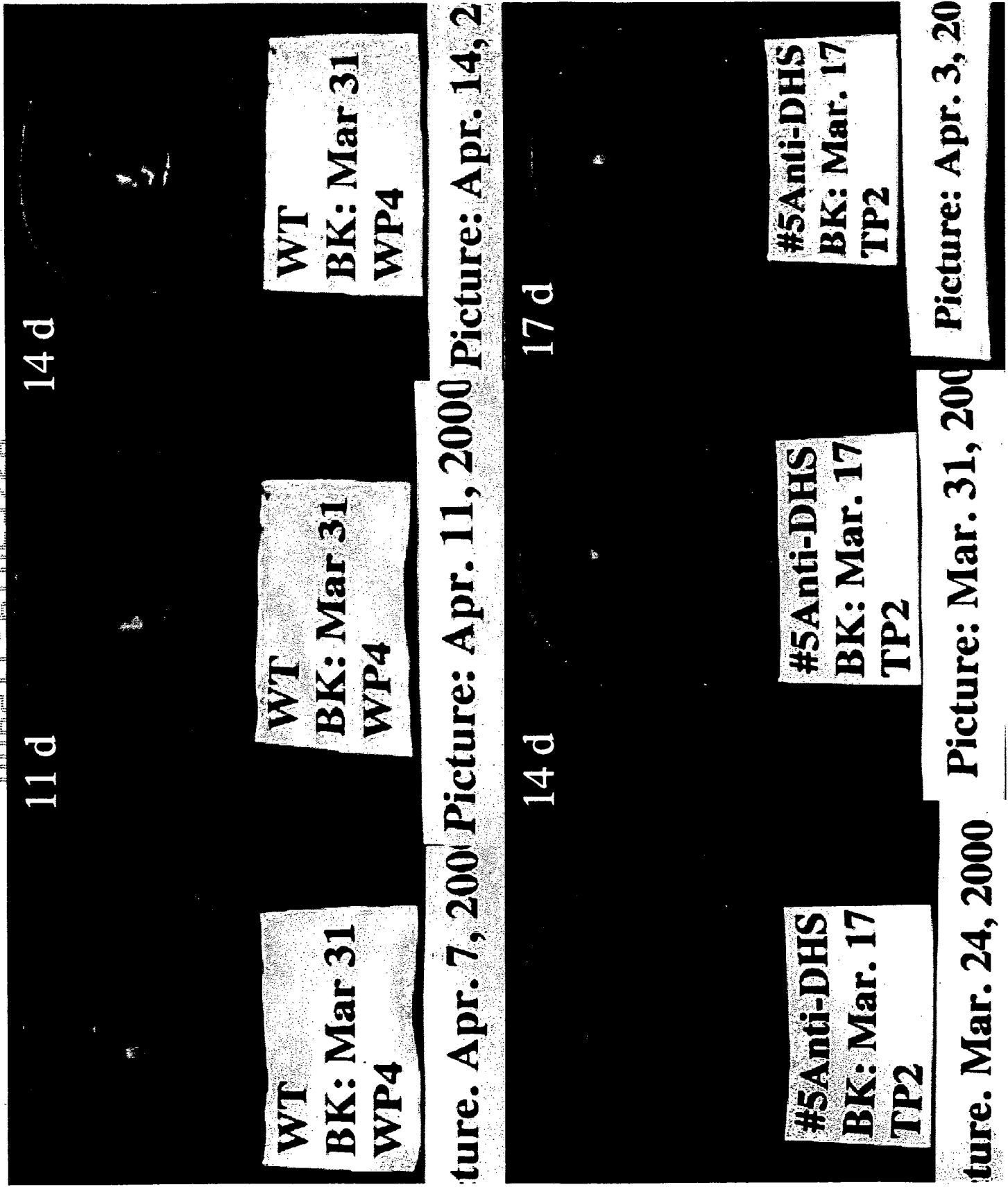


Figure 33

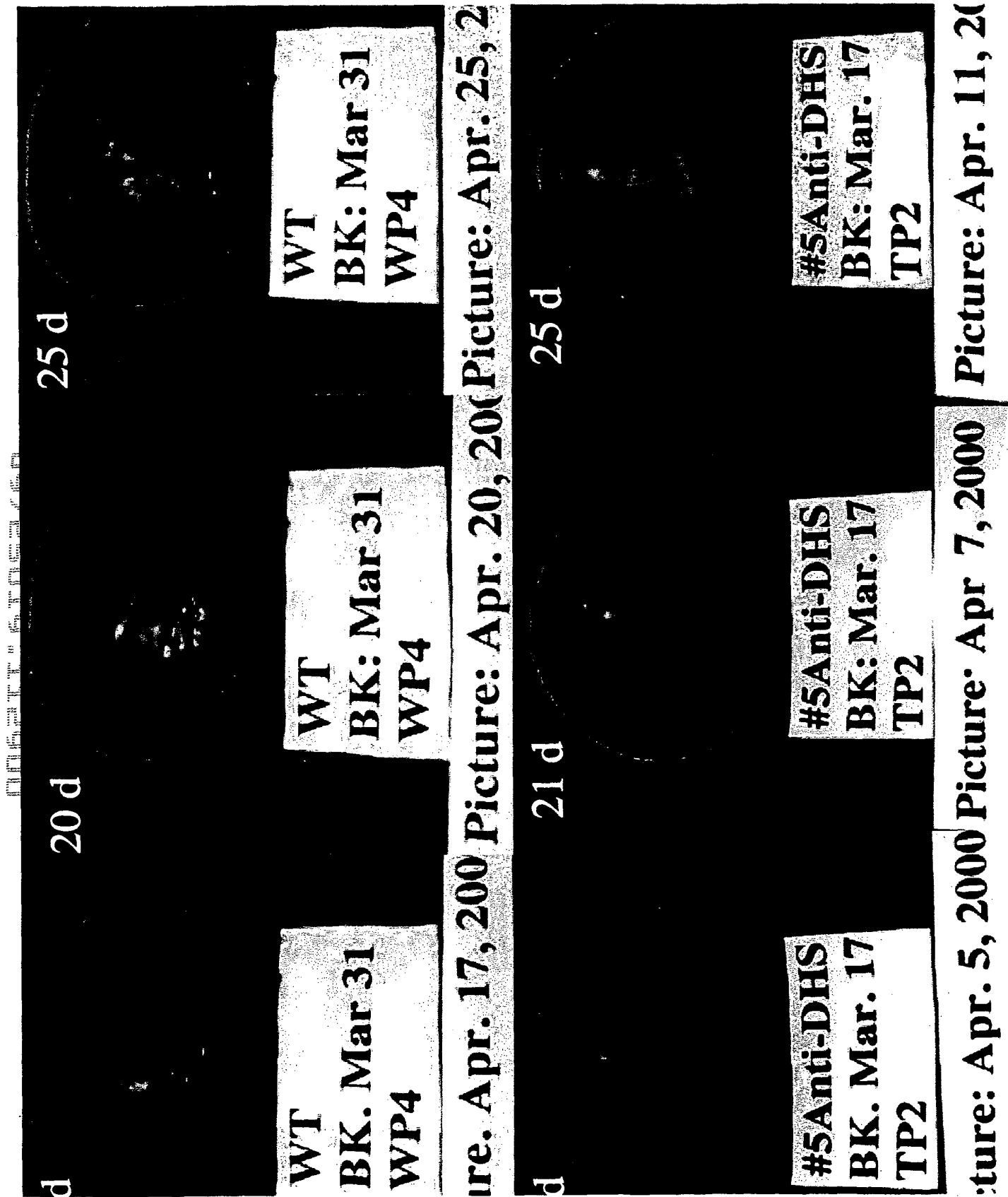
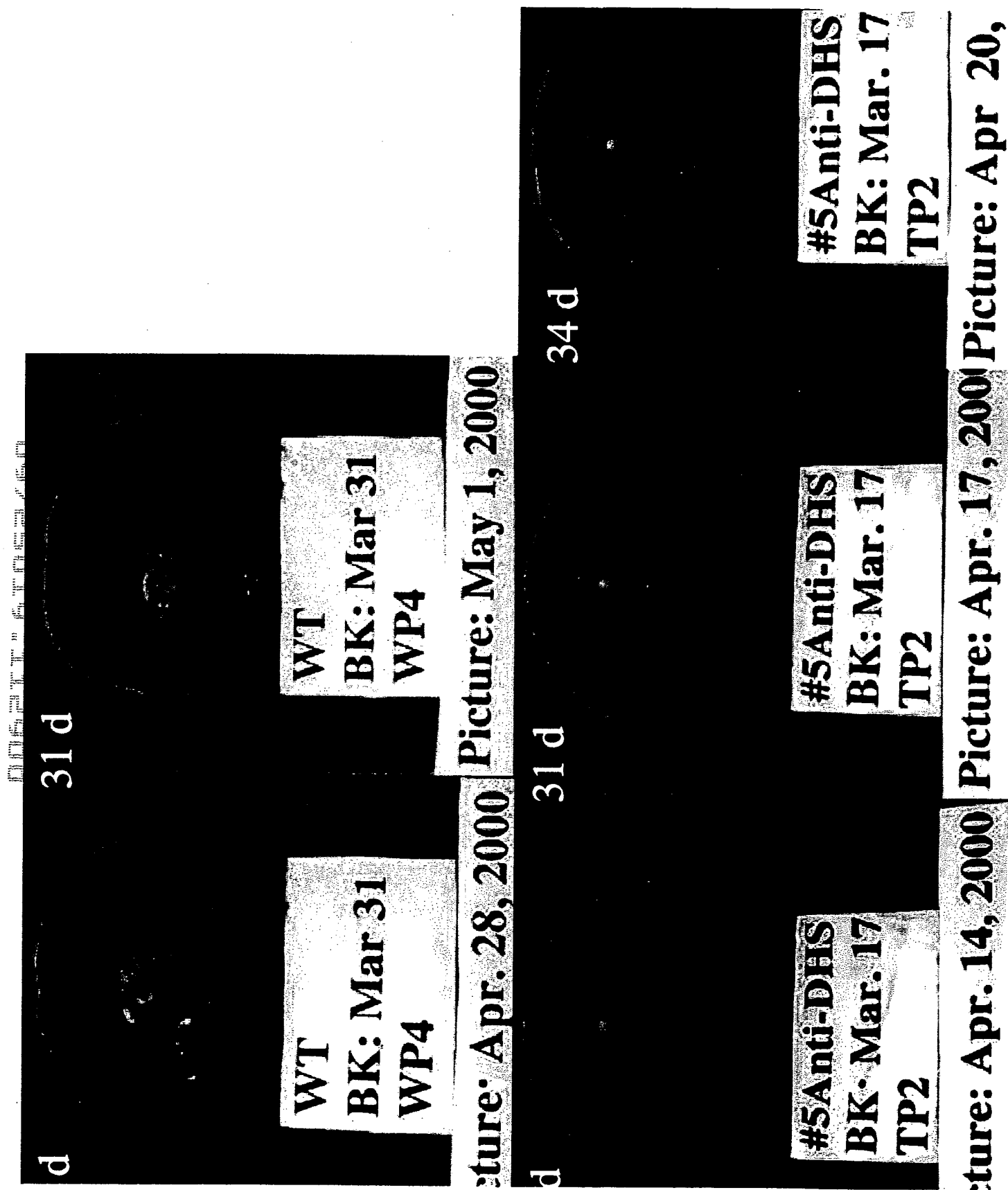


Figure 35



Arabidopsis 3'-end DHS for antisense

Nucleotide and derived amino acid sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT
A R P D E A V S W G K I R G S A K T V K V C F

TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT
L I S S H P N L Y L T Q W F

GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT
TGATTTTACACTGGAGTGACCATATAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTG
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAAGTTCCAACAAAAAAAAAAAAAAAAAAAA

Nucleotide sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT
TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT
GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT
TGATTTTACACTGGAGTGACCATATAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTG
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAAGTTCCAACAAAAAAAAAAAAAAAAAAAA

ARPDEAVSWGKIRGSAKTVKVCFLISSHPNLYLTQWF

Figure 36

09725019-119000

Tomato 3'-end-Deoxyhupsine synthase used for antisense

Nucleotide and derived amino acid sequence

GGTGCTCGTCCTGATGAAGCTGTATCATGGGGAAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCAAC
G A R P D E A V S W G K I R G G A K T V K V H C D A T

CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTCTCCCAGATAAGGTGCCAAGTTTGAA
I A F P I L V A E T F A A K S K E F S Q I R C Q V

CATTGAGGAAGCTGTCCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACTTGCTAGTGTGCAGCACCATTTA
TTCTGCAAAACTGACTAGAGAGCAGGGTATATTCCTCTACCCCGAGTTAGACGACATCCTGTATGGTTCAAATTAATTAT
TTTTCTCCCCTTCACACCATGTTATTTAGTTCTCTTCTCTTCGAAAAGTGAAGAGCTTAGATGTTTCATAGGTTTTGAATT
ATGTTGGAGGTTGGTGATAACTGACTAGTCCTCTTACCATATAGATAATGTATCCTTGTAATGAGATTTTGGGTGTGT
TTGATACCAAGGAAAAATGTTTATTTGGAAAACAATTGGATTTTAAATTTAAAAAAAATTGNTTAAAAAAAAAAAAAA

Nucleotide sequence

GGTGCTCGTCCTGATGAAGCTGTATCATGGGGAAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCAAC
CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTC

TCCCAGATAAGGTGCCAAGTTTGAACATTGAGGAAGCTGTCCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCA
ACTTGCTAGTGTGCAGCACCATTATTCTGCAAAACTGACTAGAGAGCAGGGTATATTCCTCTACCCCGAGTTAGACGAC
ATCCTGTATGGTTCAAATTAATTATTTTCTCCCCTTCACACCATGTTATTTAGTTCTCTTCTCTTCGAAAGTGAAGAG
CTTAGATGTTTCATAGGTTTTGAATTATGTTGGAGGTTGGTGATAACTGACTAGTCCTCTTACCATATAGATAATGTATCC
TTGTAATGAGATTTTGGGTGTGTTTGATACCAAGGAAAAATGTTTATTTGGAAAACAATTGGATTTTAAATTTAAAAA
AAATTGNTTAAAAAAAAAAAAAA

Figure 37

600 bp Arabidopsis Deoxyhypusine Synthase Probe

Primer1 (underlined)

GGTGGTGTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTACCTGGAGC
 TTATTTAAG
 G G V E E D L I K C L A P T F K G D F S L P G A
 Y L R
 GTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATAACTACTGCAAGTTTGAGGATTGGA
 TCATTCCCA
 S K G L N R I G N L L V P N D N Y C K F E D W I
 I P
 TCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGAATGTGTTGTGGACTCCTTCTAAACTGTTAGCACGG
 CTGGGAAAA
 I F D E M L K E Q K E E N V L W T P S K L L A R
 L G K
 GAAATCAACAATGAGAGTTCATACCTTTATTGGGCATACAAGATGAATATTCCAGTATTCTGCCCAGGGTT
 AACAGATGG
 E I N N E S S Y L Y W A Y K M N I P V F C P G L
 T D G
 CTCTCTTAGGGATATGCTGTATTTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATA
 TCAGAGCTA

S L R D M L Y F H S F R T S G L I I D V V Q D I
 R A
 TGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAG
 CACCACATA
 M N G E A V H A N P K K T G M I I L G G G L P K
 H H I
 TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAAACACCGGGCAAGAATTTGATGG
 GAGCGACTC
 C N A N M M R N G A D Y A V F I N T G Q E F D G
 S D S

GGGTGCACGCCCTGATGAAGC

G A R P D E

Primer 2 (underlined)

483 bp Carnation Deoxyhypusine Synthase Probe

GAAGATCCATCAAGTGCCTTGCACCCACTTTCAAAGGCGATTTTGCCTTACCAGGAGCTCAATTACGCTCC
AAAGGGT
R R S I K C L A P T F K G D F A L P G A Q L R S
K G

TGAATCGAATTGGTAATCTGTTGGTTCCGAATGATACTACTGTAAATTTGAGGATTGGATCATTCCAATT
TTAGATA
L N R I G N L L V P N D N Y C K F E D W I I P I
L D

AGATGTTGGAAGAGCAAATTTTCAGAGAAAATCTTATGGACACCATCGAAGTTGATTGGTCGATTAGGAAGA
GAAATAA
K M L E E Q I S E K I L W T P S K L I G R L G R
E I

ACGATGAGAGTTCATACCTTTACTGGGCCTTCAAGAACAATATTCCAGTATTTTGTCCAGGTTTAACAGAC
GGCTCAC
N D E S S Y L Y W A F K N N I P V F C P G L T D
G S

TCGGAGACATGCTATATTTTCATTCTTTTCGCAATCCGGGTTTAATCATCGATGTTGTGCAAGATATAAGA
GCAGTAA

L G D M L Y F H S F R N P G L I I D V V Q D I R
A V

ATGGCGAGGCTGTGCACGCAGCGCCTAGGAAAACAGGCATGATTATACTCGGTGGAGGGTTGCCTAAGCAC
CACATCT
N G E A V H A A P R K T G M I I L G G G L P K H
H I

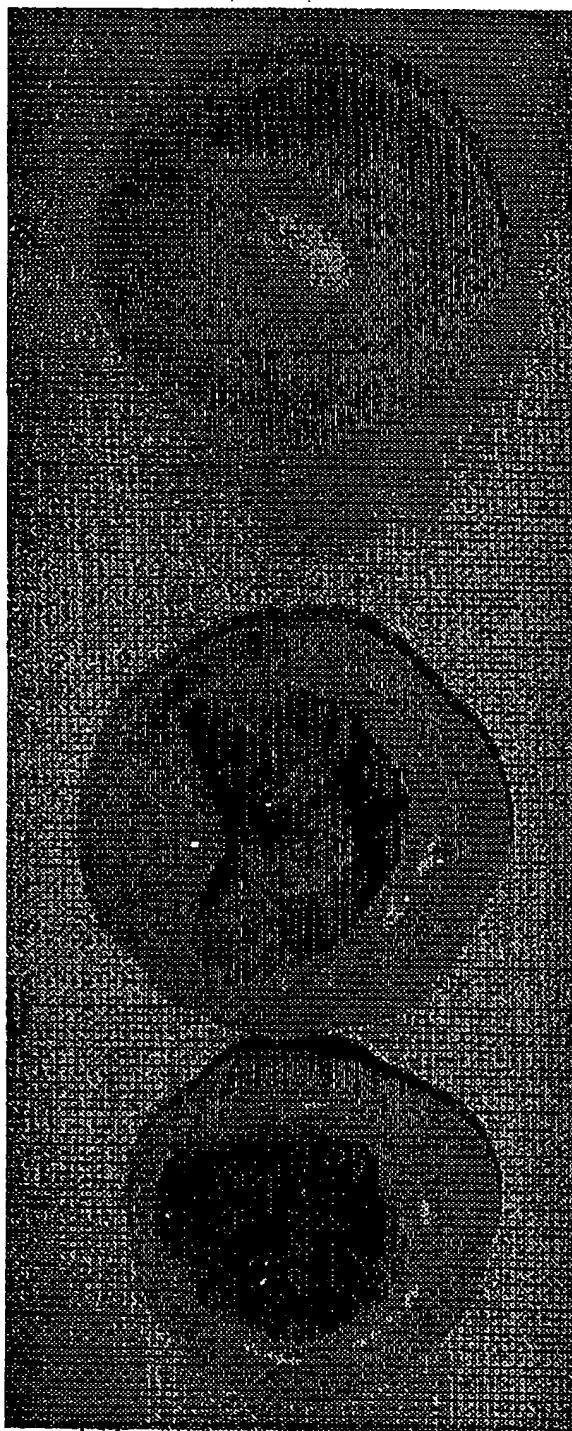
GCAACGCAAACATGATGAGAAATGGCGCCGATTATGCTGTTTTTCATCAACACCG
C N A N M M R N G A D Y A V F I N T

A full-length cDNA clone was obtained by screening a carnation senescing petal cDNA library with this probe.

Figure 39

Figure

40A



Blossom end rot

Normal

Figure

40 B

